

CLAIMS

1. A hydrodynamic bearing comprising:

(a) a shaft;

(b) a flange being a substantial disc and fixed on one end
5 of said shaft;

(c) a sleeve, when said shaft is inserted into its inside, allowed to revolve around said shaft and placed where a hollow provided on an inner surface of said sleeve is in the vicinity of a surface of said flange;

10 (d) a thrust plate hermetically sealing a first opening end of said sleeve, thereby being placed close to said flange when said shaft is inserted inside said sleeve; and

(e) a lubricant with which the whole of radial dynamic-pressure generating grooves provided at least one of a side
15 of said shaft and an inner surface of said sleeve, and the whole of thrust dynamic-pressure generating grooves provided at least one of the surfaces of said flange and said thrust plate opposed to each other, are filled and covered;

wherein:

20 inequalities $A < B$, $A < D$, $C < B$, $C < D$, $B < H$, $D < H$, and $G < H$ all hold, where A is a distance in the axial direction of said shaft between said flange and said thrust plate over said thrust dynamic-pressure generating groove and its vicinity, B is a distance in the radial direction of said shaft between a perimeter of said flange and said
25 hollow of said sleeve, C is a distance in the axial direction of

said shaft between said flange and said hollow of said sleeve, D is a distance in the radial direction of said shaft between said shaft and said sleeve around the joint between said shaft and said flange, G is a distance in the radial direction of said shaft between
5 said shaft and said sleeve over said radial dynamic-pressure generating groove and its vicinity, and H is a distance in the radial direction of said shaft between said shaft and said sleeve at a second opening end of said sleeve.

2. A hydrodynamic bearing according to Claim 1, wherein:

10 said radial dynamic-pressure generating grooves are provided in two regions, a first region near said flange and a second region near said second opening end of said sleeve; and

inequalities $E < D$, $E < F$, $G < D$, $G < F$, and $F < H$, all hold where E is a distance in the radial direction of said shaft between said
15 shaft and said sleeve in said first region, F is a distance in the radial direction of said shaft between said shaft and said sleeve in an intermediate region between said first region and said second region, and G is a distance in the radial direction of said shaft between said shaft and said sleeve in said second region.

20 3. A hydrodynamic bearing according to Claim 1, wherein said lubricant is composed of one of oil and grease, and shows a kinematic viscosity of at least $4 \times 10^{-6} \text{ m}^2/\text{s}$ at 40 degrees centigrade.

4. A disk recording/reproducing apparatus comprising:

(a) a hydrodynamic bearing comprising:

(i) a shaft;

(ii) a flange being a substantial disc and fixed on one end of said shaft;

(iii) a sleeve, when said shaft is inserted into its inside, allowed to revolve around said shaft and placed where a hollow provided on an inner surface of said sleeve is in the vicinity of a surface of said flange;

(iv) a thrust plate hermetically sealing a first opening end of said sleeve, thereby being placed close to said flange when said shaft is inserted inside said sleeve; and

(v) a lubricant composed of one of oil and grease, and showing a kinematic viscosity of at least $4 \times 10^{-6} \text{ m}^2/\text{s}$ at 40 degrees centigrade, said lubricant with which the whole of radial dynamic-pressure generating grooves provided at least one of a side of said shaft and an inner surface of said sleeve, and the whole of thrust dynamic-pressure generating grooves provided at least one of the surfaces of said flange and said thrust plate opposed to each other, are filled and covered;

wherein:

inequalities $A < B$, $A < D$, $C < B$, $C < D$, $B < H$, $D < H$, and $G < H$ all hold, where A is a distance in the axial direction of said shaft between said flange and said thrust plate over said thrust dynamic-pressure generating groove and its vicinity, B is a distance in the radial direction of said shaft between a perimeter of said flange and said hollow of said sleeve, C is a distance in the axial direction of said shaft between

said flange and said hollow of said sleeve, D is a distance in the radial direction of said shaft between said shaft and said sleeve around the joint between said shaft and said flange, G is a distance in the radial direction of said shaft between said shaft and said sleeve over said radial dynamic-pressure generating groove and its vicinity, and H is a distance in the radial direction of said shaft between said shaft and said sleeve at a second opening end of said sleeve;

(b) a base on which one of said shaft and said sleeve is fixed;

(c) a hub connected to another of said shaft and said sleeve that is not fixed on said base and allowed to revolve around said shaft;

(d) a motor installed between said base and said hub, including a magnet and a coil, and for exerting to said hub a torque for a revolution around said shaft;

(e) a magnetic disk concentrically fixed on said hub; and

(f) a head, when said magnetic disk revolves because of said torque, being placed close to a surface of said magnetic disk, recording a signal onto said magnetic disk, and reproducing a signal from said magnetic disk.

5. A disk recording/reproducing apparatus according to Claim 4, wherein:

said radial dynamic-pressure generating grooves are provided in two regions, a first region near said flange and a second region

near said second opening end of said sleeve; and

inequalities $E < D$, $E < F$, $E < H$, $F < H$, $G < D$, $G < F$, and $G < H$, all hold where E is a distance in the radial direction of said shaft between said shaft and said sleeve in said first region, F is a distance
5 in the radial direction of said shaft between said shaft and said sleeve in an intermediate region between said first region and said second region, and G is a distance in the radial direction of said shaft between said shaft and said sleeve in said second region.

6. A disk recording/reproducing apparatus according to Claim 4,
10 wherein said lubricant is composed of one of oil and grease, and shows a kinematic viscosity of at least $4 \times 10^{-6} \text{ m}^2/\text{s}$ at 40 degrees centigrade.